PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2002-169043
(43)Date of publication of application : 14.06.2002

(51)Int.Cl. G02B 6/122
G02B 6/12
G02B 6/30
G02B 6/42
H01L 31/0232
H01L 33/00
H01S 5/022

(21)Application number : 2000-367314
(22)Date of filing : 01.12.2000

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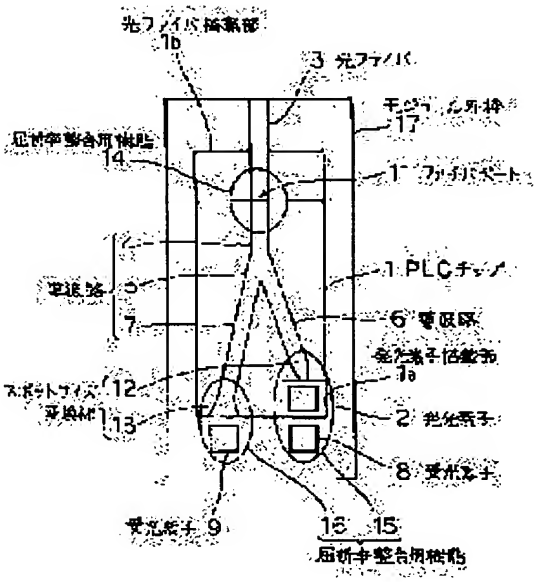
(54) OPTICAL MODULE

(57)Abstract:
PROBLEM TO BE SOLVED: To provide an optical transmitting and receiving module capable of easily realizing highly efficient coupling between an optical active element and a waveguide.
SOLUTION: A spot size converting part 12 which is composed so that the width or the thickness or both of the waveguide become smaller as they approach a light emitting element 2 is provided at the end part in which the waveguide 6 is coupled with the light emitting element 2, and a spot size converging part 13 which is composed so that the width or the thickness or both of the waveguide become larger as they approach a light receiving element 9 is provided at the end part in which the waveguide 7 is coupled with the light receiving element 9.



LEGAL STATUS

[Date of request for examination] 28.11.2001
[Date of sending the examiner's decision of rejection] 12.01.2005
[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]
[Date of final disposal for application]
[Patent number]
[Date of registration]
[Number of appeal against examiner's decision of rejection] 2005-02542

[Date of requesting appeal against examiner's decision of rejection] 14.02.2005

[Date of extinction of right]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] The optical module characterized by preparing the spot-size transducer constituted so that the width of face of waveguide, thickness, or its both might increase or decrease uniformly in the optical module with which it comes to combine an optical active element and optical waveguide in the edge combined with said optical active element of said optical waveguide.
[Claim 2] It is the optical module according to claim 1 characterized by for said optical active element being a light emitting device, and constituting said spot-size transducer so that said light emitting device side may become [the width of face of waveguide, thickness, or its both] small.
[Claim 3] It is the optical module according to claim 1 characterized by for said optical active element being a photo detector, and constituting said spot-size transducer so that said photo detector side may become [the width of face of waveguide, thickness, or its both] large.
[Claim 4] The optical module according to claim 1 characterized by filling up with the resin for index matching which has a refractive index comparable as said optical waveguide in a part for the bond part of said optical waveguide and said optical active element.
[Claim 5] Said optical waveguide is the Y branch mold optical waveguide to which one single mode waveguide branched to the 1st and the branching waveguide of **. Said optical active element It has the light emitting device combined with said 1st branching waveguide, and the photo detector combined with said 2nd branching waveguide. Said spot-size transducer The 1st spot-size transducer which it was prepared in the edge combined with said light emitting device of said 1st branching waveguide, and the width of face of waveguide, thickness, or its both consisted of so that said light emitting device side might become small, The optical module according to claim 1 with which it is prepared in the edge combined with said photo detector of said 2nd branching waveguide, and the width of face of waveguide, thickness, or its both are characterized by having the 2nd spot-size transducer constituted so that said photo detector side might become large.
[Claim 6] The optical module according to claim 5 characterized by filling up with the resin for index matching which has a refractive index comparable as said single mode waveguide in a part for the bond part of said single mode waveguide and optical fiber.
[Claim 7] Said optical waveguide is the Y branch mold optical waveguide to which one single mode waveguide branched to the 1st and the branching waveguide of **. Said optical active element It has the light emitting device combined with said 1st branching waveguide, and the photo detector combined with said single mode waveguide. Said spot-size transducer The 1st spot-size transducer which it was prepared in the edge combined with said light emitting device of said 1st branching waveguide, and the width of face of waveguide, thickness, or its both consisted of so that said light emitting device side might become small, It is prepared in the edge combined with said photo detector of said single mode waveguide. It has the 2nd spot-size transducer which the width of face of waveguide, thickness, or its both consisted of so that said photo detector side might become large. It is prepared between said single mode waveguide and said 1st branching waveguide, and the light of the 1st wavelength emitted from said light emitting device is reflected in the direction of said 2nd branching waveguide. The optical

module according to claim 1 characterized by having a wavelength selection means to penetrate the light of the 2nd different wavelength from said 1st wavelength which guides said 2nd branching waveguide. [Claim 8] The optical module according to claim 7 characterized by filling up with the resin for index matching which has a refractive index comparable as said 2nd branching waveguide in a part for the bond part of said 2nd branching waveguide and optical fiber.

[Translation done.]